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Brief

PATENT
Attorney Docket No. 99154
LVM Reference No. 204201

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

Fang et al.

Application No. 09/595,227

Art Unit: 3723

Filed: June 16, 2000

Examiner: Hadi Shakeri

For: METHOD FOR POLISHING A MEMORY
OR RIGID DISK WITH A PHOSPHATE
ION-CONTAINING POLISHING
SYSTEM

APPELLANTS' REPLY BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Appellants hereby file a reply brief to the Examiner's Answer. The Examiner's Answer was mailed by the U.S. Patent and Trademark Office on August 6, 2003, thereby making the reply brief due October 6, 2003. This reply brief is provided in further support of the appeal of the decision of the final rejection of claims 1-23, as set forth in the Office Action dated June 13, 2002.

Related Appeals and Interferences

The Examiner's Answer asserts that Appellants' Appeal Brief does not contain the required statement identifying related appeals and interferences. As stated in Appellants' Appeal Brief: "There are no appeals or interferences that are related to this appeal." More particularly, there are no appeals or interferences known to appellants, appellants' legal representatives, or the assignee, which will directly affect or be affected by or have a bearing on the Board's decision in the pending appeal.

Grouping of Claims

The Examiner's Answer contends that the claims should stand or fall together and that Appellants have not argued otherwise. As stated in Appellants' Appeal Brief: "The appealed claims do not stand and fall together." Specifically, claims 1-14 and 17-23 should be

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considered separately for purposes of this appeal. The separate grouping of these claims is confirmed by the Examiner's separate rejections of these claims, which are discussed in Appellants' Appeal Brief.

Argument

The Examiner's Answer essentially presents three arguments in support of the obviousness rejections of the appealed claims and in purported response to Appellants' Appeal Brief: (1) the motivation to combine the references can be found in either Huynh et al. and James et al., (2) one of ordinary skill in the art would necessarily arrive at the invention recited in the appealed claims upon the combination of the disclosures of Huynh et al. and James et al., and (3) one of ordinary skill in the art would have a reasonable expectation of success based on the teachings of Huynh et al. and James et al. that the claimed invention would work. Appellants respectfully disagree.

1. Lack of Motivation to Combine

One of ordinary skill in the art would not be motivated to combine the teachings of James et al. with those of Huynh et al. without the benefit of improper hindsight. There is nothing in Huynh et al. that points to its combination with James et al. Similarly, there is nothing in James et al. that points to its combination with Huynh et al.

The Examiner's Answer points to the disclosure in Huynh et al. that the polishing composition disclosed therein can be used in polishing a semiconductor substrate and "can also be used for other substrates" as the motivation to combine the disclosures of James et al. and Huynh et al. In this regard, the Examiner's Answer has misconstrued the teaching of Huynh et al. at col. 1, lines 5-20, as suggesting the application of the polishing composition of Huynh et al. to both microelectronic and memory disk substrates. The Examiner's Answer specifically points to col. 1, lines 19 and 20, of Huynh et al., which states that "metals such as aluminum, copper, and tungsten are planarized" and that "these metal surfaces are oxidized," as a suggestion of "a memory disk, which typically uses aluminum alloy disc blank with a nickel-phosphorus surface coating" (Examiner's Answer, page 4, lines 19-20). However, a proper reading of the text at col. 1, lines 5-20, clearly shows that Huynh et al. is directed to microelectronics having reduced metal surfaces which become oxidized during the chemical-mechanical polishing ("CMP") process due to the presence of oxidizers. The Examiner appears to have interpreted the phrase "are oxidized" as a teaching that "other substrates" include those comprising "pre-oxidized" metal surfaces, to which group the Examiner alleges nickel-phosphorus coated aluminum alloy surfaces belong. This is quite a stretch.

Since Huynh et al. fails to teach or suggest that the polishing composition disclosed therein can be used to polish memory disk substrates, one must look to James et al. for evidence of a motivation to combine. In this regard, the Examiner's Answer points out that James et al. is "utilized to illustrate that CMP systems are used for memory disks as well as semiconductors" and alleges that James et al. discloses the interchangeability of a CMP system in polishing substrates (Examiner's Answer, page 4, line 21, to page 5, line 1). The disclosure of James et al., when taken as a whole, cannot be considered to provide this nexus. James et al. is directed to a CMP system primarily consisting of a fixed abrasive polishing pad. The details of the polishing fluid to be used therewith are very broad, allowing for the fact that different types of substrates may be used in conjunction with the polishing pad and that these different substrates will require different components in the polishing fluid.

The Examiner's Answer further states that the "evidence to select the polishing composition of Huynh et al. is within the disclosure of Huynh et al., i.e., to resist pH changes" (Examiner's Answer, page 4, lines 8-10). This statement seems to suggest that, since James et al. discloses the desirability of using a polishing fluid that provides a substantially consistent pH during polishing, and since Huynh et al. provides a slurry that is resistant to pH changes, there is motivation to combine these references. However, there is nothing in James et al. which points to the selection of the polishing composition of Huynh et al. over that of any other reference similarly disclosing a polishing composition comprising a pH modifier, pH buffer, or other means of maintaining consistent pH. The Examiner's Answer has failed to provide any explanation for the propriety of selecting Huynh et al. from among many possible references, several of which relate specifically to memory disk substrates.

The Examiner's Answer acknowledges Appellants' arguments in this regard; however, the Examiner's Answer fails to directly respond to the argument (Examiner's Answer, page 5, lines 4-5). Rather, the Examiner's Answer cites to U.S. Patent 6,431,953, which purports to show that microelectronic devices include rigid memory disks. The '953 patent, however, does not constitute prior art to the present application and, in any event, does not pertain to polishing systems. As previously pointed out by Appellants, the art has recognized the distinction between microelectronics and memory disks (see, e.g., *IEEE Standard Dictionary of Electrical and Electronics Terms*, 4th Ed. 1988 at pages 553 and 588, presented in response to the Office Action dated September 25, 2001). Accordingly, the '953 patent is not persuasive evidence that one of ordinary skill in the art would have been motivated to make the combination of references presented by the Examiner without the benefit of hindsight. Absent sufficient evidence of such a motivation to combine the

particular references relied upon by the Examiner to support the obviousness rejection, the Examiner cannot be considered to have presented a *prima facie* case of obviousness.

2. *Result of Combination is Not Present Invention*

Even if there was motivation to combine the disclosures of the Huynh et al. and James et al., which there is not, the combination does not necessarily result in all of the elements of the claimed invention. In order to arrive at the claimed invention based on the combination of Huynh et al. and James et al., one of ordinary skill in the art would have to decide on polishing a memory disk with a polishing composition and then select a phosphate compound from among the list of possible choices to serve as a buffer component and utilize an amount of that phosphate compound of about 0.04 M or higher. However, neither Huynh et al. nor James et al. directs one of ordinary skill in the art to polish a memory disk using a polishing system that comprises a phosphate or phosphonate ion concentration of about 0.04 M or higher, as recited in the appealed claims.

As explained in Appellants' Appeal Brief, Huynh et al. provides too many choices and no teaching or suggestion to make the choices necessary to arrive at the present invention. Indeed, if anything, Huynh et al. teaches away from the present invention. James et al. is no more relevant. Indeed, the Examiner's Answer incorrectly states that James et al. discloses "all the elements of claim 1 as recited except for 0.04 M or higher phosphate or phosphoric [*sic* – phosphonate] ion" (Examiner's Answer, page 3, lines 17-23). Even accepting the characterization set forth in the Examiner's Answer, however, the polishing fluid of James et al. does not include (a) an oxidizing agent or (b) about 0.04 M or higher phosphate or phosphonate ion, both of which are required by the appealed claims. The disclosure of a "pH modifier" by James et al. is neither a disclosure of an oxidizing agent nor a phosphate or phosphonate ion. Therefore, James et al. – even as characterized in the Examiner's Answer – lacks a disclosure of two elements of the invention as defined by the appealed claims, not just one element as alleged in the Examiner's Answer, and does not cure the deficiencies of Huynh et al.

In particular, Huynh et al. discloses a laundry list of buffer components, only a few of which contain phosphate ions, and none of which are phosphonate ions. Nothing in Huynh et al. or James et al. provides any motivation to choose a phosphate ion-containing buffer component over the other disclosed buffer components that do not contain phosphate ions. In fact, Huynh et al. teaches against the selection of a phosphate ion by disclosing that the combination of acetic acid and ammonium hydroxide (col. 3, lines 29-32) is the preferred acid/base combination with respect to silica-containing polishing compositions. Thus, to the

extent that Huynh et al. and James et al. provide any guidance in this respect, they teach away from the subject matter of the appealed claims.

Moreover, Huynh et al. teaches a broad concentration, covering 7 orders of magnitude, along with a narrower range of 0.01 M to 0.1 M, of the concentration of acid and base compounds in the buffer. The concentration ranges encompass the entire spectrum of acid and base compounds disclosed in Huynh et al. Neither Huynh et al. nor James et al. provide any teaching or suggestion that would lead one of ordinary skill in the art to use a sufficient amount of a compound to yield 0.04 M or higher phosphate ion. The Examiner's Answer asserts that the claimed concentration range of 0.04 M or higher would be achieved through "routine optimization." The acid and base compounds, which have a wide range of pK_a values (i.e., from 2 to 11), can be combined in varying amounts to produce buffer solutions having a wide range of pH values (i.e., about 3 to less than 11 (col. 2, lines 21-22)). The concentration of the acid and base in the buffer component determines the capacity and pH of the buffer. Based on the teachings of Huynh et al., one of ordinary skill in the art would set out to optimize the buffer properties of the polishing composition by selecting the ideal combination of acid and base components to obtain a buffer with the greatest buffer capacity at the desired buffer pH *such that the combination of acid and base does not affect the polishing rate*, in accordance with the explicit teaching of Huynh et al. (see, e.g., col. 4, lines 18-20). Such optimization, therefore, would cause the ordinarily skilled artisan to be *led away* from the claimed range of 0.04 M or higher phosphate ion when the substrate to be polished is a memory or rigid disk, since the claimed range produces an increase in the polishing removal rate with respect to the polishing of a memory or rigid disk (as taught in the present patent application). The disclosure of James et al. does not cause one of ordinary skill in the art to ignore these teachings of Huynh et al. and somehow inevitably be led to the present invention.

Absent a teaching or suggestion to make the proper choices, one of ordinary skill in the art would not have necessarily arrived at the claimed invention based on the combined disclosures of Huynh et al. and James et al. and without the benefit of the hindsight knowledge of the present invention. In fact, by following the teachings of Huynh et al. and James et al., one of ordinary skill in the art would be led away from the invention as defined by the appealed claims.

3. *No Reasonable Expectation of Success*

In response to Appellants' Appeal Brief, the Examiner's Answer urges that there would have been a reasonable expectation of success because "phosphates are listed and the range of the amount used ... is also met by the disclosure of the range" and "discovering

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optimum or workable ranges involves only routine skill in the art" (Examiner's Answer, page 5, lines 15-20). These statements, however, do not serve to confirm that one of ordinary skill in the art would have had a reasonable expectation that greater than about 0.04 M phosphate or phosphonate ion would be useful in polishing a memory disk substrate. Huynh et al. and Jones et al. disclose a wide variety of components for the compositions and a wide variety of substrates to be polished with the resulting compositions. At most, it might have been obvious to try the particular combination of components to form a composition that is then used to polish a memory disk, as recited in the appealed claims, but an obvious to try rationale is insufficient to support an obviousness rejection under Section 103.

Conclusion

For the foregoing reasons, as well as those set out in Appellants' Appeal Brief, Appellants respectfully urge that the Examiner's rejections be reversed.

Respectfully submitted,


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